Patent
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Ana M. Almaguer

Ana M. Almaguer
Date: May 18, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the accompanying application of)
)
Johannis J. Den Boer et al.)
)
Serial No.: 10/621,494)
)
Filed : July 17, 2003)
)
Marking of Pipe Joints) May 18, 2005

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Sir:

CLAIM TO PRIORITY

Applicants reaffirm the claim for the benefit of filing date of the following foreign patent application referred to in Applicants' Declaration:

European application Serial No. 02077922.9 filed July 18, 2002

A copy of the application certified by the European Patent Office is enclosed.

Respectfully submitted,

Johannis J. Den Boer et al.

By _____
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Europäisches Patentamt	European Patent Office	Office européen des brevets

Bescheinigung | Certificate | Attestation

Die angehefteten Unterlagen stimmen mit der ursprünglich eingereichten Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.

The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

Patentanmeldung Nr. | Patent application No. | Demande de brevet n°

02077922.9

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
p.o.

R C van Dijk

Anmeldung Nr:
Application no.: 02077922.9
Demande no:

Anmeldetag:
Date of filing: 18.07.02
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Anmelder/Applicant(s)/Demandeur(s):

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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se referer à la description.)

Marking of pipe joints

In Anspruch genommene Priorität(en) / Priority(ies) claimed /Priorité(s) revendiquée(s)
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B23K20/00

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AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LU MC NL PT SE SK TR

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Peb

MARKING OF PIPE JOINTS

Background of the invention

The invention relates to a method for marking of welded pipe joints.

When pipes are joined and used in for example a downhole, sub-sea or remote environment it is advantageous to log the position of individual pipes or to detect the position of individual pipes when the pipe and/or surrounding hole is re-entered. This is useful to eg. allow accurate placement of side-tracks, packers and perforations.

At the moment logging of this nature is done by measuring the distance a tool has traveled within or adjacent to the pipe, counting the number of connections or by positioning easily identifiable markers, such as magnetic or radioactive markers, in the hole alongside, and attached to, the pipe, which may be a production tubing and/or casing which marker may be found using specialized equipment. In addition special pup joints are often used for this purpose. The existing methods for marking pipe joints are expensive, time consuming and may lead to a quick wear of the markings and replacement of worn markings may require retrieval of the entire pipe string from a well, which is very expensive.

An object of the present invention is to provide a cheap and reliable method of placing markers along strings of tubulars, such that the markers are well protected and not vulnerable to wear or dislodging after installation.

Summary of the Invention

The method according to the invention comprises creating a cavity into the end surface of one of the tubular ends that are to be welded together, inserting a marker into said cavity and subsequently welding the tubular ends together.

The thus inserted marker may comprise an electronic tag such as a passive radio frequency identification tag, or a magnetic or radioactive material and the cavity may be machined at or near the center of said end surface.

The invention also relates to a string of welded tubulars that are marked in accordance with the invention, so that a marker is permanently arranged in a cavity adjacent to at least one welded tubular joint. The tubular string may comprise a plurality of joints that are provided with markers, wherein each marker transmits a radio, magnetic, radioactive or other detectable signal, which is detected using appropriate equipment, and may be different to the signal transmitted by any other marker.

The tubular string may be a string of oil field and/or well tubulars.

Thus, the present invention provides an improved method of marking joint locations when used with welding techniques, such as forge welding, fusion welding, diffusion welding, amorphous bonding, friction welding or other techniques in which a metallurgical bond is formed between abutted pipe ends. It preferably involves positioning a marker mid-wall in a tubular joint such that it is an integral part of the joint and cannot be dislodged.

Description of a preferred embodiment

These and further features and advantages of the method according to the present invention will be described in more detail with reference to the accompanying drawings in which

Fig.1 is a longitudinal sectional view of prepared and mated ends of pipe joints suitable for welding in which a marker has been inserted in accordance with the method according to the invention; and

Fig.2 is an enlarged longitudinal section view of the prepared and mated ends and marker shown in Fig.1.

As shown in Figures 1 and 2 the method according to the invention involves preparing the tubular ends 1 and 2 of a tubular joint for welding, and machining a slot or hole 3 into an end face of one of the tubular ends 1.

A small electronic tag, or amount of radioactive or magnetic material may then be placed securely into the slot 3 to act as a permanent marker 4. When welding takes place the area containing the marker is forged and the marker 4 becomes trapped inside the made-up string of pipes, which are lowered into the hole. When necessary it may then be detected using an appropriate logging device.

C L A I M S

1. A method of marking the location of a welded tubular joint, the method comprising creating a cavity into the end surface of one of the tubular ends that are to be welded together, inserting a marker into said cavity and subsequently welding the tubular ends together.

2. The method of claim 1, wherein the marker comprises an electronic tag, magnetic or radioactive material.

3. The method of claim 1 or 2, wherein the cavity is machined at or near the center of said end surface.

4. A string of welded tubulars, wherein a marker is arranged in a cavity adjacent to at least one forge welded tubular joint.

5. The string of claim 4, wherein a plurality of joints are provided with markers.

6. The string of claim 5, wherein each marker transmits a radio, magnetic, radioactive or other detectable signal which is different to the signal transmitted by any other marker.

7. The string of any one of claims 4-6, wherein the string is a string of oil field and/or well tubulars.

A B S T R A C T

MARKING OF PIPE JOINTS

An improved method of permanently marking the location of a tubular joint comprises creating a cavity into the end surface of one of the tubular ends that are to be forge welded together, inserting a marker into said cavity and subsequently forge welding the tubular ends together.

(Fig.1)

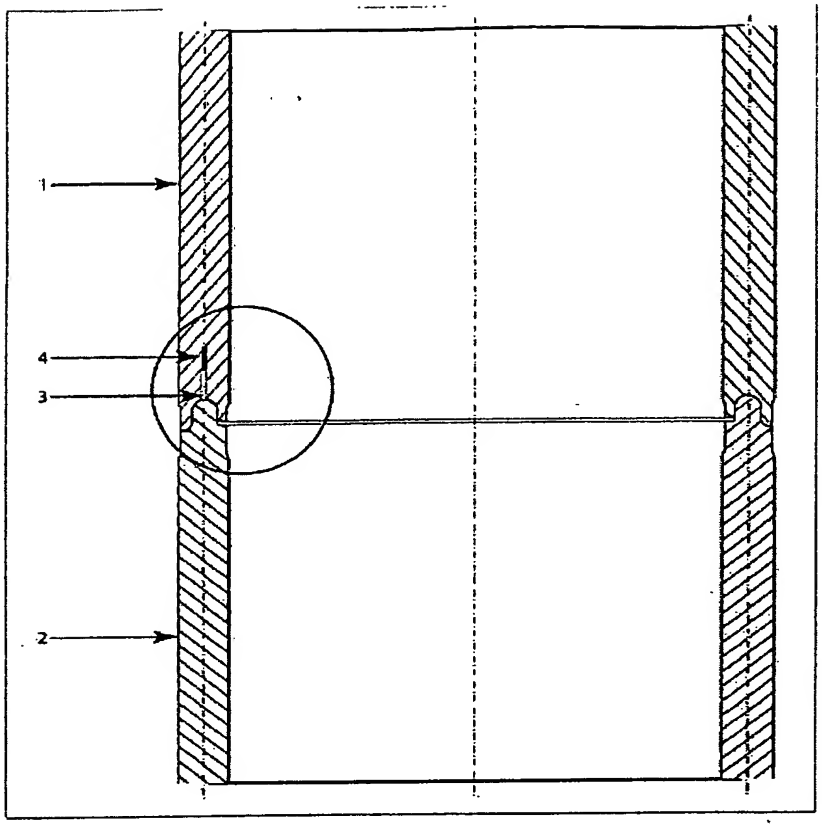

Figure 1

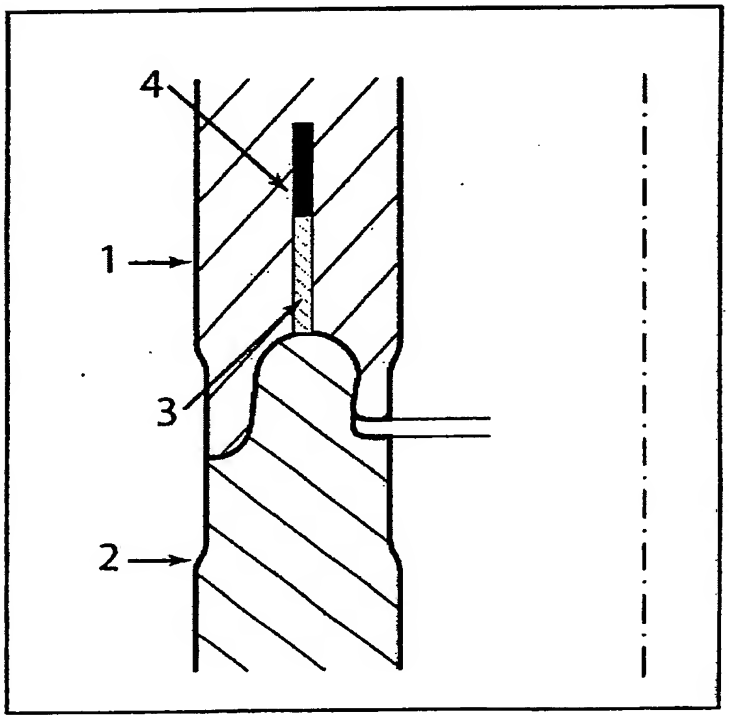

Figure 2